

attract insects or rodents or present a nuisance or unsightly condition on the premises. These materials shall be disposed of, either by incineration, burial or other methods approved by the Department of Natural Resources. Garbage in this section shall be taken to mean any putrescible animal or vegetable wastes resulting from the handling, preparation, cooking and consumption of food. Refuse shall mean any combustible or noncombustible waste other than garbage and shall include among other things: paper; cardboard; tin cans; wood; glass; bedding; ashes; crockery; and similar materials.

(6) Requirements for supportive facilities are as follows:

(A) When lavatories and bathing facilities are provided, they shall be substantially constructed, kept in good repair, conveniently located, maintained in a clean sanitary manner and used for no other purpose. If soap and towels are provided for bathing facilities, they shall be for individual use only. All bathing facilities shall be operated in such a manner as not to become a nuisance or injurious to the health, comfort, safety and welfare of the guests;

(B) Adequate and conveniently located facilities shall be provided and maintained in a clean sanitary condition and kept in good repair at all times;

(C) All plumbing systems, changes or repairs required in existing plumbing systems, shall be constructed and maintained in a manner approved by the Department of Health. All plumbing systems with cross connections between a potable water supply system and one of doubtful purity are prohibited. Direct connection of a water supply line to sewers for flushing purposes is prohibited. Fixtures and appurtenances such as tubs, sinks, lavatories, etc. shall be constructed in such a manner that it will not be possible for back siphonage to occur; and

(D) Resort swimming pools shall be designed, constructed and maintained in a manner approved by the Department of Health. Competent supervision for the operation and maintenance of swimming pools shall be provided and an adequate supply of chemicals necessary for the proper operation of swimming pool water-treatment facilities shall be kept at all times in order to assure effective continuous operation.

*Auth: sections 192.020 and 315.250, RSMo (1986). This rule was previously filed as 13 CSR 50-66.010. Original rule filed as Missouri Division of Health E 9.01 on Sept. 4, 1957, effective Sept. 14, 1957.*

### 19 CSR 20-3.060 Minimum Construction Standards for On-Site Sewage Disposal Systems

**PURPOSE:** *This rule establishes minimum construction standards for on-site sewage disposal systems. In accordance with the authority granted in section 701.040, RSMo, this rule establishes the minimum standards and criteria for the design, location, installation and repair of individual on-site sewage disposal systems to promote the public health and general welfare and to protect the surface and ground waters of the state.*

**Editor's Note:** *The secretary of state has determined that the publication of this rule in its entirety would be unduly cumbersome or expensive. The entire text of the material referenced has been filed with the secretary of state. This material may be found at the Office of the Secretary of State or at the headquarters of the agency and is available to any interested person at a cost established by state law.*

#### (1) General.

(A) Definitions. Definitions as set forth in Chapter 701, RSMo, On-Site Sewage Disposal Law shall apply to those terms when used in this rule unless the context clearly requires otherwise or as noted in this subsection. For the purposes of these standards, certain terms or words used here shall be interpreted as follows. The word shall is mandatory and the words should and may are permissive. All distances, unless otherwise specified, shall be measured horizontally:

1. Administrative authority—The governing body which may include, but is not limited to, county health departments, planning and zoning commissions, county building departments, county public works department, sewer districts, municipalities and the Missouri Department of Health which has, as authorized by statute, charter or other form of enabling authority, adopted these standards for individual on-site sewage disposal systems;

2. Aeration unit—Any sewage tank which utilizes the principle of oxidation in the decomposition of sewage by the introduction of air into the sewage;

3. Alluvium—Soil parent material which was transported and deposited in a running water setting;

4. Alternative—An individual sewage disposal system employing methods and devices as presented in section (6) of this rule;

5. Approved—Considered acceptable by the administrative authority;

6. Baffle—A device installed in a septic tank for proper operation of the tank and to provide maximum retention of solids. This

includes vented sanitary tees and submerged pipes in addition to those devices normally called baffles;

7. Bedrock—That layer of geologic material which is consolidated;

8. Bedroom—Any room within a dwelling that might reasonably be used as a sleeping room. The number of bedrooms in a residence as given by an appraiser will be used in determining volumes in the sizing of on-site sewage disposal systems;

9. Black water—Liquid-carried waste from a dwelling or other establishment, which contains organic wastes, including excreta or other body wastes, blood or other body fluids, and garbage;

10. Building sewer—That part of the drainage system which extends from the end of the building drain and conveys its discharge to an on-site sewage disposal system;

11. Capacity—The liquid volume of a sewage tank using inside dimensions below the outlet;

12. Color—The moist color of the soil based on the Munsell soil color system;

13. Distribution pipes—Perforated rigid pipes that are used to distribute sewage tank effluent in a soil treatment system;

14. Dosing chamber (or pump pit or wet well)—A tank or separate compartment following the sewage tank which serves as a reservoir for the dosing device;

15. Dosing device—A pump, siphon or other device that discharges sewage tank effluent from the dosing chamber to the soil treatment system;

16. Dwelling—Any building or place used or intended to be used by human occupants as a residential unit(s);

17. Effluent—The liquid discharge of a septic tank or other sewage treatment device;

18. Gravelless system—An absorption system recognized by the administrative authority as an acceptable method of subsurface disposal of sewage without the required use of gravel. The following are examples:

A. Large diameter, eight inch (8") and ten inch (10") corrugated, perforated plastic pipe, wrapped in a sheath of spun-bonded filter wrap;

B. Chamber system; and

C. Drip irrigation;

19. Gray water—Liquid waste, specifically excluding toilet, hazardous, culinary and oily wastes, from a dwelling or other establishment which is produced by bathing, laundry or discharges from floor drains;

20. Grease trap—A device designed and installed so as to separate and retain oils and fats from normal wastes while permitting normal sewage or wastes to discharge into the drainage system by gravity;

21. Ground absorption sewage treatment and disposal system—A system that utilizes the soil for the subsurface disposal of partially treated or treated sewage effluent. The following are examples:

A. Chamber system—A system that uses an open bottom structure which forms an underground chamber over the soil's infiltrative surface. The wastewater is discharged into the chamber through a central weir, trough or splash plate and is allowed to flow over the infiltrative surface in any direction;

B. Conventional soil absorption system—A system that distributes effluent by gravity flow from the septic or other treatment tank and applies effluent to the soil through the use of a seepage trench or bed;

C. Dosing soil absorption system—A system that distributes effluent by a pump or automatic siphon to elevate or distribute effluent to the soil through the use of a seepage trench or bed;

D. Drip soil absorption system—An experimental system that distributes effluent through drip lines in a grid pattern (also known as trickle irrigation); and

E. Pressure distribution system—A soil absorption system that distributes effluent by a pump and smaller diameter distribution piping with small diameter perforations to distribute effluent;

22. Hazardous waste—Any waste or combination of wastes, as determined by the Hazardous Waste Commission by rules, which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness, or pose a present or potential threat to the health of humans or the environment;

23. High ground water—Zones of soil saturation which include: perched water tables, shallow regional groundwater tables or aquifers, or zones that are seasonally, periodically or permanently saturated;

24. High-water level—The highest known flood water elevation of any lake, stream, pond or flowage or the regional flood elevation established by a state or federal agency;

25. Holding tank—A watertight tank for temporary storage of sewage until it can be transported to a point of approved treatment and disposal;

26. Horizon—A layer of soil, approximately parallel to the surface, that has distinct characteristics relative to adjacent layers;

27. Individual sewage disposal system—A sewage disposal system, or part of a system, serving a dwelling(s) or other establishment(s), which utilizes subsurface soil treatment and disposal;

28. Intermittent sand filters—Intermittent sand filters are beds of granular materials twenty-four to thirty-six inches (24–36") thick underlain by graded gravel and collecting pipe. Waste water is applied intermittently to the surface of the bed through distribution pipes or troughs and the bed is underdrained to collect and discharge the final effluent. Uniform distribution is normally obtained by dosing so as to flood the entire surface of the bed. Filters may be designed to provide free access (open filters) or may be buried in the ground (buried filters or subsurface sand filters);

29. Matrix color—The dominant color of a soil material;

30. Mottling—Spots or splotches of color interspersed in the dominant (or matrix color) of a soil material. Mottles may be of a wide variety of colors;

31. Mound system—A system where the soil treatment area is built above the ground to overcome limits imposed by proximity to water table or bedrock or by rapidly or slowly permeable soils;

32. Non-ground absorption sewage disposal system—A facility for waste treatment designed not to discharge to the soil, land surface, or surface waters, including, but not limited to, incinerating toilets, mechanical toilets, composting toilets and recycling systems;

33. Other establishment—Any public or private structure other than a dwelling which generates sewage;

34. Pan—A soil horizon compacted, hard or very high in clay content. These horizons are usually very slowly permeable. Common pans in Missouri are claypans and fragipans;

35. Perched water table—A saturated zone above and separated from the water table by a horizon which is unsaturated;

36. Percolation rate—The time rate of drop of a water surface in a test hole as specified in subsection (2)(C) of this rule and expressed in minutes per inch;

37. Permeability—The ease with which liquids and gases move within the soil or rock;

38. Plastic limit—A soil moisture content below which the soil may be manipulated for purposes of installing a soil treatment system and above which manipulation will cause compaction, puddling and smearing, as determined by the administrative authority. This is not to be confused with plastic limit as used or defined in the Unified Soil Classification System;

39. Privy—An outhouse or structure used for receiving human excrement in a container or vault beneath the structure;

40. Registered geologist—A person who meets the requirements of Chapter 256, RSMo;

41. Restrictive horizon—A soil horizon that is capable of perching groundwater or sewage effluent and that is brittle and strongly compacted or strongly cemented with iron, aluminum, silica, organic matter or other compounds. Restrictive horizons may occur as fragipans, iron pans or organic pans and are recognized by their resistance in excavation or in use of a soil auger;

42. Rock fragments—The percentage by volume of rock fragments in a soil that are greater than two millimeters (2 mm) in diameter or retained on a No. 10 sieve which may include, but is not restricted to, chert, sandstone, shale, limestone or dolomite;

43. Sanitarian—A person registered either as a sanitarian or environmental health professional by the National Environmental Health Association or the Missouri Board of Certification for Environmental Health Professionals or employed as a sanitarian or environmental health professional by the administrative authority;

44. Seepage bed—An excavated area larger than three feet (3') in width which contains a bedding of aggregate and has more than one (1) distribution line;

45. Seepage trench—An area excavated one to three feet (1–3') in width which contains a bedding of aggregate and a single distribution line;

46. Septage—Those solids and liquids removed during periodic maintenance of a septic or aeration unit tank or those solids and liquids removed from a holding tank;

47. Septic tank—Any watertight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer, separate solids from liquid, digest organic matter, store liquids through a period of detention and allow the clarified liquids to discharge to a soil treatment system;

48. Setback—A separation distance measured horizontally;

49. Severe geological limitations—Site-specific geologic conditions which are indicative of rapid recharge of an aquifer and likely groundwater contamination. Locations with significant groundwater contamination potential should be investigated by a registered geologist to determine if the site has severe geological limitations. Standardized criteria for determination of severe geological limitations are available in the form *Assessment of Individual On-Site Waste Disposal Geological Limitations* from the Department of Natural Resources, Division of Geology and Land Survey;

50. Sewage—Any water-carried domestic waste, exclusive of footings and roof drainage. Domestic waste includes, but is not limited to, liquid waste produced by bathing, laundry, culinary operations, liquid wastes from toilets

and floor drains and specifically excludes animal waste and commercial process water. Also known as wastewater;

51. Sewage flow—Flow as determined by measurement of actual water use or, if actual measurements are unavailable, as estimated by the best available data provided by Table 2A in subsection (1)(E) of this rule;

52. Sewage tank—A watertight tank used in the treatment of sewage which includes, but is not limited to, septic tanks and aeration units;

53. Sewage tank effluent—That liquid which flows from a septic tank or aeration unit under normal operation;

54. Significant groundwater contamination potential—Any condition which would cause or indicate rapid recharge of an aquifer. This includes, but is not limited to, the following conditions or parameters: a water sample from an on-site well which exceeds drinking water standards with respect to fecal coliform; a hydrologic connection is established between the on-site waste disposal system and any well; a disposal field to be placed in Class V soils or soils with a percolation rate less than ten minutes per inch (10 min./in.); a disposal field within one hundred feet (100') of the topographic drainage of a sinkhole; or a sewage tank with fifty feet (50') of the topographic drainage of a sinkhole;

55. Sinkhole—A land surface depression that is hydraulically connected with a subterranean passage developed by a solution or collapse into the underlying bedrock, or both;

56. Site—The area bounded by the dimensions required for the proper location of the soil treatment system;

57. Slope—The ratio of vertical rise or fall to horizontal distance;

58. Soil—The naturally occurring, unconsolidated mineral or organic material of the land surface developed from rock or other parent material and consisting of sand, silt and clay-sized particles and variable amount of organic materials;

59. Soil characteristics, limiting—Those soil characteristics which preclude the installation of a standard system, including, but not limited to, evidence of water table or bedrock closer than three feet (3') to the ground surface and percolation rates slower than one hundred twenty minutes per inch (120 min./in.);

60. Soil saturation—The condition that occurs when all the pores in a soil are filled with water;

61. Soil scientist—An individual who has a minimum of fifteen (15) semester credit hours of soils course work including a minimum of three (3) hours in the area of soil morphology and interpretations, and has a minimum of two (2) years of field experience;

62. Soil textural classification—Soil particle sizes or textures specified in this rule refer to the soil textural classification in the *Soil Survey Manual Handbook No. 18*, United States Department of Agriculture, 1993;

63. Soil treatment area—That area of trench or bed bottom which is in direct contact with the trench rock of the soil treatment system;

64. Soil treatment system—A system where sewage tank effluent is treated and disposed of below ground surface by filtration and percolation through the soil. It includes those systems commonly known as seepage bed, trench, drainfield, disposal field and includes mound and low pressure pipe systems;

65. Standard system—An individual sewage disposal system employing a building sewer, sewage tank and the soil treatment system commonly known as seepage bed or trenches, drainfield or leachfield;

66. Toilet waste—Fecal matter, urine, toilet paper and any water used for flushing;

67. Trench rock—Clean rock, washed creek gravel or similar insoluble, durable and decay-resistant material free from dust, sand, silt or clay. The size shall range from one inch to two and one-half inches (1" — 2 1/2"). If limestone, dolomite or other crushed white rock is used, it shall be washed and be a minimum size of one and one-half inches (1 1/2");

68. Valve box—Any device which can stop sewage tank effluent from flowing to a portion of the soil treatment area. This includes, but is not limited to, caps or plugs on distribution or drop box outlets, divider boards, butterfly valves, gate valves or other mechanisms;

69. Very slowly permeable—Soils, bedrock and soil horizon or layer having a vertical permeability less than one inch (1") in twenty-four (24) hours;

70. Wastewater—same as sewage as defined in paragraph (1)(A)50. of this rule;

71. Wastewater stabilization pond—A sealed earthen basin which uses the natural unaided biological processes to stabilize wastewater (also known as a sewage lagoon);

72. Water table—The highest elevation in the soil or rock where all voids are filled with water, as evidenced by presence of water or soil mottling or other information. This includes perched water tables or perched zones of saturation; and

73. Watertight—Constructed so that no water can get in or out below the level of the outlet.

(B) Applicability. For this rule, on-site wastewater treatment and disposal system means all equipment and devices necessary for proper conduction, collection, storage, treatment and disposal of wastewater from a

dwelling or other facility producing sewage of three thousand gallons (3000 gals.) or less per day. Included within the scope of this rule are building sewers, septic tanks, subsurface absorption systems, mound systems, intermittent sand filters, gravelless systems, aeration unit wastewater treatment systems and single family wastewater stabilization ponds. Commercial or industrial facilities and developers of subdivisions must first contact the Department of Natural Resources concerning compliance with the Missouri Clean Water Law and Regulations before applying for any approvals or permits under this rule.

#### (C) Responsibilities.

1. The design, construction, operation and maintenance of sewage treatment and disposal systems, whether septic tank systems, privies or alternative systems, shall be the responsibility of the designer, owner, developer, installer or user of the system.

2. Actions of representatives of the administrative authority engaged in the evaluation and determination of measures required to effect compliance with the provisions of this rule shall in no way be taken as a guarantee or warranty that sewage treatment and disposal systems approved and permitted will function in a satisfactory manner for any given period of time. Due to the development of clogging mats, which adversely impact the life expectancy of normally functioning ground absorption sewage treatment and disposal systems and variables influencing system function which are beyond the scope of this rule, no guarantee or warranty is implied or given that a sewage treatment and disposal system will function in a satisfactory manner for any specific period of time.

3. Prior to the issuance of a permit to install or effect major repair of an on-site sewage disposal system as regulated by Chapter 701, RSMo, plans and specifications shall be required for review. Approval by the administrative authority shall be required for—

A. Plans for absorption field showing the following:

(I) Field locations with slope(s) indicated or with contour lines based on field measurement. If field areas are essentially flat or of uniform grade, spot elevations will be required for alternate systems;

(II) Field layout, length, spacing, connection, pipe sizes and cleanout details, invert elevations of flow distribution devices and laterals, valves and appurtenances;

(III) Trench plan and profile drawings and flow distribution device details;

(IV) Location and design of associated surface and ground water drainage systems;

(V) Name, address and telephone number of the person(s) drafting the plans; and

(VI) Any other information required by the administrative authority; and

B. Alternative systems whether or not specifically described in this rule.

4. The entire sanitary sewage system shall be on property owned or controlled by the person owning or controlling the system. Necessary easements shall be obtained permitting the use and unlimited access for inspection and maintenance of all portions of the system to which the owner and operator do not hold undisputed title. Easements shall remain valid as long as the system is required and shall be recorded with the county recorder of deeds.

(D) Minimum Set-Back Distances. All on-site wastewater treatment and disposal systems shall be located in accordance with the distances shown in Table 1.

Table 1—Minimum Set-Back Distances

Minimum Distance From	Sewage Tank <sup>1</sup>	Disposal Area <sup>2</sup>	Lagoons
	(feet)	(feet)	(feet)
Private water supply well <sup>3</sup>	50	100	100
Public water supply well	300	300	300
Cistern	25	25	25
Spring	50	100	100
Classified stream, lake or impoundment*	50	50	50
Stream or open ditch <sup>4</sup>	25	25	25
Property lines	10	10**	75
Building foundation	5	15	15
Basement	15	25	25
Swimming pool	15	15	15
Water line under pressure	10	10	10
Suction water line	50	100	100
Upslope interceptor drains	-	10	10
Downslope interceptor drains	-	25	25
Top of slope of embankments or cuts of two feet (2') or more vertical height	-	20	20
Edge of surficial sink holes	50	100	500
Other soil absorption system except repair area	-	20	20

\*A classified stream is any stream that maintains permanent flow or permanent pools during drought periods and supports aquatic life.

\*\*Recommend twenty-five feet (25') of downslope property line initially, but repair may be allowed to ten feet (10') of downslope property line.

<sup>1</sup>Includes sewage tanks, intermittent sand filters and dosing chambers.

<sup>2</sup>Includes all systems (sand filter, wetland and the like) except wastewater stabilization ponds.

<sup>3</sup>Unplugged abandoned wells or wells with less than eighty feet (< 80') of casing depth shall have one-hundred-fifty feet (150') minimum distance from all above.

<sup>4</sup>Sewage tanks and soil absorption systems should never be located in the drainage area of a sinkhole.